

NexGenBus

Background

Current programs such as F/A-18 E/F, F-22, and JSF all have composite data rate requirements that exceed the capacity of any single instrumentation system bus. These programs have accommodated their data requirements with a clumsy arrangement of multiplexers. The increased fusion of data from numerous sources (i.e. analog measurements, digital buses, digital radar data, and digitized video) to support testing and simulation will simply overwhelm this approach. The instrumentation community needs a single standard instrumentation bus with data rates significantly greater than the current standard. To comply with Acquisition Reform and the emphasis on COTS hardware, the instrumentation community needs to adopt a high speed bus standard. This would provide the instrumentation vendors a clear commercial interface standard that can be used to modify/develop COTS hardware.

This standard interface will enable the instrumentation community to leverage off developments and purchasing power in other industrial areas – like the consumer PC market. Many benefits can be derived from sharing a common bus. The most obvious is a lower cost of ownership for the bus itself (interface hardware, support equipment, and software). Additional benefits include the portability of the data and peripherals (hard drives, displays, etc) that may be adapted for use in a test article.

Program

The NexGenBus program is trying to locate an open commercial communications bus that can be adapted to the instrumentation environment. Our focus is at the lower layers of the OSI model (i.e. Physical, Data Link, and Network). Although packets are central to current communications busses, we are not trying to define the packets at this time. We are primarily concerned with establishing a solid bus that will serve our needs for years to come.

Request

We are very excited about the positive impacts, a NexGenBus standard will have on our industry. However, we realize a standard is useful only if it is widely embraced. As a result, we are trying to provide information as well as solicit feedback with this questionnaire. Please answer the attached questionnaire to enable us to define a standard that will benefit everyone. For more information, please see the web site listed below or give me a call.

Thank you,

Sid Jones

NexGenBus Program Manager

301-342-1601 x32

301-342-7557 Fax

<http://NexGenBus.nawcad.navy.mil>

Industry Questionnaire

Company _____

P.O.C. _____

Phone _____

Fax _____

EMAIL _____

Please return questionnaire to:
NextGenBus Project Office

Attn: Sid Jones

301-342-1601 x32

301-342-7557 Fax

Jones_Sid%pax1@mr.nawcad.navy.mil

Instructions: Please answer as many of the following questions the best you can. The contact information requested above is to allow NexGenBus to contact you for discussions pertaining to your responses.

Standards

1. What do you see as the major requirements for an instrumentation bus?
2. What do you see as the major requirements for a NETWORKED instrumentation bus?
3. Are there any candidate busses we should be aware of?
4. Are you aware of any major technical deficiencies to any of the three standards we are considering (Fibre Channel, Firewire, Ethernet)?

Business

5. Do you see networked instrumentation systems as part of your business plan?
6. What busses are you currently designing hardware to?
7. Have you received any inquiries to build networked instrumentation systems?
8. How would you rank the following bus attributes for a new project requiring a bus interface?

_____ 1) Current/Future industry acceptance	_____ 4) "Quality of Service" issues
_____ 2) Cost	_____ 5) Scaleability
_____ 3) Installed user base	_____ 6) Technical capability

Specific

9. Some busses allow nodes to communicate at rates less than the system rate. Is there any cost benefit to building units to communicate at multiple speeds that better match unit throughput versus always communicating at high speed (even for a thermocouple unit)?
10. Would you need data, video, and voice transmitted on the same bus?
11. What are your high speed requirements, circle one in each row

Current	< 100 Mbps	< 500 Mbps	< 1 Gbps	> 1 Gbps
Projected (10 yrs)	< 100 Mbps	< 500 Mbps	< 1 Gbps	> 1 Gbps

Other

12. Do you see any major advantages of a networked instrumentation bus?
13. Do you see any major disadvantages of a networked instrumentation bus?
14. Based on current knowledge, what are the top communication standards?
 - A At the lower levels (e.g. Fibre Channel, Fire Wire, etc.)
 - B At the upper levels (e.g. SCI, ATM, TCP/IP, etc.)
15. Is an instrumentation bus standard a good idea?
16. What information would you like to regularly see come out of the NexGenBus office?
17. Other comments.